

WE CLAIM:

1. A system for percutaneous delivery of bone cement during a surgical procedure, comprising:

a plunger assembly, comprising:

a shaft having a first end, a middle section, and a second end, wherein said middle section is threaded; and

a handle attached to said first end of said shaft;

a dispenser hub assembly around said shaft, said dispenser hub assembly having a collar and a hand-grip attached to said collar, and a threaded portion formed on an interior surface of said collar; and

a hollow tube for containing the bone cement during the surgical procedure having a first end and a second end, said first end of said hollow tube adapted to be removably engaged with said threaded portion of said dispenser hub assembly,

wherein said shaft is axially displaceable through said hollow tube for controlled displacement of the bone cement through said second end of said hollow tube.

2. The system of Claim 1, wherein said shaft displaces through said hollow tube when said handle is subjected to an external rotational force.

3. The system of Claim 1, wherein said hollow tube includes a funnel-shaped opening at said first end for facilitating the receipt of the bone cement in said hollow tube.

4. The system of Claim 1, wherein said second end of said shaft further comprises:
 - a groove formed therein; and
 - sealing means located in said groove for creating a seal between said shaft and an interior surface of said hollow tube for the delivery of the bone cement.
5. The system of Claim 4, wherein said sealing means is an "O" ring.
6. The system of Claim 1, further comprising a release assembly disposed in a void formed in said dispenser hub assembly for controlling the axial displacement of said shaft through said hollow tube.
7. The system of Claim 6, said release assembly further comprising:
 - a trigger having a threaded portion for releasably engaging said shaft; and
 - a spring having a first end in contact with said trigger and a second end in contact with said dispenser hub assembly, wherein the bias of said spring causes said trigger to engage said shaft.
8. The system of Claim 7, wherein a force applied to said trigger sufficient to overcome the bias of said spring causes said trigger to disengage said shaft and enables said shaft to be withdrawn from said hollow tube.

9. The system of Claim 6, wherein said release assembly is adapted to selectively release pressure that may occur while applying the bone cement during the surgical procedure.
10. The system of Claim 1, wherein said second end of said shaft is unthreaded to prevent said shaft from being completely removed from said dispenser hub assembly.
11. The system of Claim 1, wherein said hollow tube is approximately 10cc in volume.
12. The system of Claim 1, wherein said hollow tube is transparent.
13. The system of Claim 1, wherein an exterior surface of said hollow tube includes a plurality of graduations located thereon.
14. The system of Claim 1, wherein said handle of said dispenser hub assembly is ergonomically shaped for the comfort of the user.
15. The system of Claim 1, wherein said second end of said hollow tube is adapted to receive a tubing assembly for facilitating the delivery of the bone cement during the surgical procedure.
16. The system of Claim 1, wherein said hollow tube is disposable.

17. A cement dispensing apparatus for percutaneous delivery of bone cement from a disposable hollow tube to a patient during a surgical procedure, said apparatus comprising:

actuation means, comprising:

a shaft having a first end, a middle section, and a second end; and

a handle attached to the first end of the shaft; and

a dispenser hub assembly, around the shaft of said actuation means, said dispenser hub assembly having a collar and a hand-grip attached to said collar, and a threaded portion formed on an interior surface of said collar adapted to receive the disposable hollow tube.

18. The apparatus of Claim 17, wherein the shaft of said actuation means is axially displaceable through the disposable hollow tube for controlled displacement of the bone cement through the disposable hollow tube when the handle of said actuation means is subjected to an external rotational force.

19. The apparatus of Claim 17, wherein the second end of the shaft further comprises:

a groove formed therein; and

sealing means located in the groove for creating a seal between the shaft and an interior surface of the disposable hollow tube for the delivery of the bone cement.

20. The apparatus of Claim 17, further comprising a release assembly disposed in a void formed in said dispenser hub assembly for controlling the axial displacement of the shaft through the disposable hollow tube.

21. A multi-use cement dispenser kit, comprising:

cement delivery means for delivering bone cement into a patient during a surgical procedure, said cement delivery means comprising:

a plunger assembly, having a shaft and a handle attached to one end of the shaft; and

a dispenser hub assembly, around said shaft of said plunger assembly; and

at least one hollow tube for containing the bone cement during the surgical procedure, said hollow tube adapted to be removably attached to said dispenser hub assembly,

wherein the shaft of said cement delivery means is axially displaceable through said hollow tube for controlled displacement of the bone cement through said hollow tube.

22. The multi-use cement dispenser kit of Claim 21, further comprising:

at least one tubing assembly having a first end and a second end, said first end removably attachable to said hollow tube.

23. The multi-use cement dispenser kit of Claim 22, said tubing assembly further comprising a luer fitting attached to each of said first and second ends of said tubing assembly.

24 The multi-use cement dispenser kit of Claim 22, further comprising:

at least one cannula for insertion into the patient during the surgical procedure having a first end and a second end, wherein said first end is adapted to receive said tubing assembly.

25. The multi-use dispenser kit of Claim 24 further comprising:

at least one stylet for insertion into said at least one cannula, said at least one stylet having a tip geometry selected from the group consisting of: a sharp pyramid tip, an angled tip, a blunt tip, and a corkscrew tip.

26 The multi-use dispenser kit of Claim 25 further comprising:

a hammer for installing said at least one cannula into the bone of the patient.

27. The multi-use dispenser kit of Claim 25, further comprising:

a forceps assembly for facilitating the insertion of said at least one cannula into the bone of the patient.

28. A method for the percutaneous delivery of bone cement into a patient during a surgical procedure using a multi-use cement dispensing apparatus, said method comprising the steps of:

filling a disposable hollow tube with the bone cement;

attaching a first end of the hollow tube to the multi-use cement dispensing apparatus;

attaching a second end of the hollow tube to a cannulae assembly inserted into the patient;

applying an external rotational force to the multi-use cement dispensing apparatus for delivery of the bone cement through the hollow tube, the cannulae assembly, and into the patient;

removing the hollow tube from the multi-use cement dispensing apparatus and the cannulae assembly; and

repeating the above steps as necessary until the surgical procedure is completed.